

## ABSTRACT

A mass transfer column (20) is provided with an external shell defining an open internal region. Centrifugal contact trays (26) and return contact trays (28) are positioned in an alternating and vertically spaced apart relationship within the open internal region. Each contact tray has a plurality of vapor passages (33) for allowing vapor to flow upwardly through the tray deck to interact with liquid on the surface of the tray deck. At least one center downcomer (40) extends downwardly at an opening in the return tray deck and has a lower discharge outlet spaced above the centrifugal tray deck for feeding liquid onto the centrifugal tray deck. A rotation-inducing element may be placed within the center downcomer (40) to induce a rotational motion in liquid exiting the center downcomer (40). At least one annular downcomer (36) extends downwardly the periphery of the centrifugal tray deck and has a lower discharge outlet spaced about the return tray deck for feeding liquid onto the return tray deck. At least one of the centrifugal contact trays is positioned a greater distance above an adjacent return contact tray than the distance at least one of the return contact trays is positioned above an adjacent centrifugal contact tray. The mass transfer column (20) may further include a single support ring (64), one or more baffles (68) or combinations thereof.